Furthermore, the therapeutic side of the whole cancer question is in a state of ferment and it seems extremely probable that the very near future will develop therapeutic means for the treatment of the malady other than surgical.

Consultation among the members of the Cancer Committee, as well as with the members of the Publication Committee and other of our members, brings the committee before you with the opinion that the time is not quite ripe for presenting the cancer problem to the general public in the form of a published statement. We advise, therefore, that the Cancer Committee be, for the present, discharged.

EMMETT RIXFORD.
D'ARCY POWER.
W. FRANCIS B. WAKEFIELD.

MEMBERS AND GUESTS REGISTERED AT THE FORTY-SECOND ANNUAL MEETING OF THE MEDICAL SOCIETY, STATE OF CALIFORNIA, DEL MONTE, CAL., APRIL, 1912.

Adams, Lemuel P.; Aiken, G. H.

Ballance, H. N.; Barbart, J. H.; Barlow, W. J.; Ballance, H. N.; Barbat, J. H.; Barlow, W. J.; René; Birtch, F. W.; Blake, W. F.; Boalt, G. D.; Boardman, W. W.; Bowles, F. H.; Brem, Walter; Briggs, L. H.; Briggs, W. E.; Brophy, T. W.; Brown, Douglas; Browning, C. C.; Browning, F. W.; Bryson, Ch. W.; Brunn, H.; Bullock, N. H.; Bunnell, S.; Burkelman, Arnold; Burnham, F. R.; Buteau, S. H.

Carpenter, F. B.; Castle, H. E.; Cheney, W. F.; Chidester, W. C.; Chipman, E.; Christiansen, H. B.; Clark, H. H.; Clark, V. G.; Clark, W. A.; Cochran, Guy; Cooper, C. M.; Cox, H. M.; Crabtree, H. T.; Crosby, D.; Crowley, D. D.; Connor, A. S.; Conrad, D. A.

Dawson, W. J. G.; Deane, Louis; Deal, D. L.; Dempsey, R. B.; de Obarrio, P.; Dillon, E. T.; Dudley, W. H.; Dunn, Robt.

Ebright, G. E.; Edwards, T. C.; Ellis, H. Bert; Ellis, Lula T.; Evans, Geo. H.; Eloesser, L.; Enos, M. M.; Ewer, Geo. N.

Feeley, M. A.; Fitzpatrick, L. B.; Fly, E. M.; Force, J. N.; Franklin, J. H.; Franklin, W. S.; French, J. R.; Freytag, F.; Friedlander, D.; Fry, P. B.; Fulton, Dudley.

Gates, M. J.; Graham, H. B.; Gillihan, A. F.; Glover, M. W.; Gould, N. B.; Grimes, W. D.; Gross, Louis; Grosse, A. B.

Hall, J. U.; Hamilton, Jo; Hare, Chas. B.; Hare, J. B.; Hamlin, O. D.; Hartzel, R. H.; Hare, Geo. H.; Hastings, Hill; Henderson, A. M.; Hill, Harold P.; Hoag, E. B.; Hoisholt, A. W.; Horn, Henry; Hulen, Vard H.; Hunkin, S. J.; Huntington, T. W. Irwin, W. H.

Jaffa, Prof.; Jones, Philip Mills; Johnson, W. S.; Jordan, P.

Kane, J. M.; Keck, W. H.; Kelly, E. E.; Kelly, A. S.; Kenyon, C. G.; Kerr, W. W.; King, John C.; King, Jos. M.; Krotoszyner, M.

Lee, Helen; Linforth, G. S.; Livingston, W. R.; Lobingier, A. S.; Lohse, J. L.; Lucas, W. T.; Lukens, Anna; Lum, Wm.

Maher, J.; Malsberg, G. E.; Manson, P.; Martin, H. R.; Maxson, H. S.; McCleave, T. C.; McClenahan, H. C.; McCoy, George W.; Miller, A. V.; Miller, Chas. H.; Miller, F. W.; Milton, J. L.; Mitchell, C. O.; Mitchell, Elsie R.; Montgomery, D. W.; Morton, A. W.; Moore, E. C.; Moore, H. S.; Moore, Ross; Moore, W. G.; Morrison, S. K.; Morrow, Howard; Musser, F. R.; Mudd, J. L.

Nagel, C. S. G.; Nelson, J. E.; Nittler, A. N.; Nusbaumer, P. S.

Oldham, J. Y.; Oliver, H. R.; O'Brien, E. S.; O'Brien, J. T.; O'Neill, A. A.; O'Neill, B. J.; Ophuls, Wm.; Orbison, T. J.

Page, C. W.; Parkinson, Jas. H.; Parker, Garth; Paterson, Frank; Peers, R. A.; Peoples, S. Z.; Phillips, P. T.; Piper, H. E.; Pischel, K.; Pope, Saxton T.; Pond, C. P.; Porter, Horace; Porter, Langley; Pottenger, F. M.; Powell, B. J.; Power, H. D'Arcy; Powers, L. M.; Putnam, H. A.

Reinle, Geo. G.; Reinhardt, G. F.; Richards, C. M.; Richardson, W. W.; Rigdon, R. L.; Rixford, E.; Robertson, R. L.; Rogers, F. L.; Rooney, R. F.; Roth, L. J.; Rothganger, Geo.; Ryfkogel, H. A. L.; Russ, Raymond.

Sawyer, W. A.; Schaller, W. F.; Schmitt, L. S.; Seawell, J. W.; Shannon, J. M.; Sherk, H. H.; Sherman, H. M.; Shipman, C. G.; Sleeper, Karl R.; Simpson, Wm.; Smith, Dudley; Smith, Rea; Snow, W. F.; Stabel, F.; Stafford, A. A.; Stansbury, O.; Stephenson, C. C.; Stivers, C. G.; Stoddard, C. S.; Stover, Wm. M.; Stratton, Robt.; Strictman, W. H.; Somers, Howard.

Tait, Dudley; Taubles, G. H.; Teaby, W. L.; Tebbe, F. H.; Terry, W. I.; Thomas, C. P.; Thomas, H. G.; Thomas, J. B.; Tucker, George.

Van Zwalenburg, C.; Vecki, V.; von Adelung, Edward.

Wakefield, W. F. B.; Walker, J. R.; Wallace, Wm. S.; Waterman, Helen J.; Watkins, J. T.; Wayland, Clyde; Wayland, C. A.; Wedgepeth, W. R.; Welty, C. F.; Wilbur, Ray; Williams, Ralph; Williams, T. N.; Wilson, Carl; Winterberg, W. H.; Witherbee, O. O.

Yates, H. N.; Yerrington, H. H.

Zinisser, Hans.

DELEGATES AND ALTERNATES REGISTERED AT THE FORTY-SECOND ANNUAL MEETING OF THE MEDICAL SOCIETY, STATE OF CALIFORNIA, DEL MONTE, APRIL, 1912.

Parkinson, J. H.; Ellis, H. Bert; Kress, Geo. H.; Powell, B. J.; Tait, Dudley; Franklin, W. S.; Vecki, V. G.; Bryson, Chas. W.; Edwards, T. C.; Burnham, F. R.; Bering, R. E.; Ryfkogel, H. A. L.; King, J. M.; Lavenson, R. S.; Hedgepeth, W. R.; Sherk, H. H.; Thomas, C. P.; Fly, E. M.; Rogers, F. L.; Hoisholt, A. W.; Miller, F. W.; Bine, René; Hunkin, S. J.; Browning, C. C.; Smith, Dudley; O'Brien, E. S.; Orbison, T. J.; Lobingier, A. S.; Brem, W.; Walker, J. R.; Nusbaumer, Pauline; Tucker, G. E.; Reinle, G. G.; Adams, Lemuel P.; Ewer, G. N.; Osborne, A. E.; Horn, H.; Reynolds, G. P.; Conrad, D. A.; Kenyon, C. G.; Livingston, W. R.; Oliver, H. R.; Welty, C. F.; Power, H. D'Arcy; Richards, C. M.; Patterson, F. H.; Oldham, J. Y.; Fry, P. B.; Dempsey, R. B.; Bullock, N. H.; Crabtree, H. T.; Fitzpatrick, E. B.; O'Neill, A. A.; Stabel, F.; Peoples, S. O.; McClenahan, H. C.; Fulton, D.; Moore, E. C.; Smith, Rea; Watkins, J. T.; Barney, H. N.; Miller, A.; Stover, W. M.; Aiken, G. H.; Beebe, J. L.; O'Neill, B. J.; Lohse, J. L.; Schmitt, L. S.; Hare, G. A.; Crosby, D.; Gillihan, A. F.; Chidester, W. C.; Henderson, A. M.; Ebright, Geo. E.; Sleeper, Karl R.; Clark, V. G.; Terry, W. I.; Barlow, W. J.; Witherbee, O. O.; Sherman, H. M.; Somers, H.; Montgomery, D. W.; Chipman, E. D.; Briggs, W. E.; Wayland, Clyde; Stansbury, O.; Thomas, J. B.; Cooper, C. M.; Thomas, H. G.; Eloesser, Leo.

THE TREATMENT OF SPINAL CURVATURE.*

By JAMES T. WATKINS, M. D., San Francisco.

(Continued from Page 204—May.)

To an appreciation of the principles underlying treatment of scoliosis, some reference to its mechanics, in so far as we understand them, is essential.

* Read before the Alameda County Medical Society, September, 1911.

In 1844 Bigelow noticed that a spine bends forward and to the side in the dorsal region as does a blade of grass—when the attempt is made to bend the latter through its widest diameter. That is, it revolves on its longitudinal axis to bend through its narrowest or thinnest diameter. I have here a piece of sponge rubber cut so that it is wider from before backward than from side to side. Pins are stuck in it to represent spinous processes, while a different kind of pin is placed at right angles to them to represent transverse processes and ribs. If I attempt to bend the rubber rod forward and to the side, the body will rotate so that the first pins—that is spines—point to the concavity of the curve, while the second pins—that is the transverse processes, point backward on the convex side and forward on the concave side. This is precisely what takes place in the thoracic column during flexion and side bending. The spines point to the concavity of the curve and the ribs project backward on the convexity.

The lumbar column behaves under flexion and side bending as does a piece of sponge rubber which is wider from side to side than before backward. That is, the spinous processes look to the convexity and the transverse processes point forward on the convex side. Of course, when the lumbar spine is lordosed—that is bent backward—the process is reversed and the bodies look toward the convexity.

Spinal curvatures, from whatever cause, usually begin as the simple C-shaped type. The so-called compensatory curves which appear in the S-shaped variety are due to a combination of the involuntary effort to return to the perpendicular and of the thrusts exerted by the same forces which caused the C-shaped deviation acting upon the other and differently shaped groups of vertebral bodies.

Manifestly then, spines are subject to the laws governing flexible rods. But when a spine has long maintained a posture of flexion and side bending, a variable segment of it, located near the center of the curve, becomes rigid. At once this changes the whole mechanical aspect of the problem. For now we no longer have a flexible rod, subject to the laws governing flexible rods, but an inflexible rod which is protected from our attacks by the portions which are still flexible and which are continuous with it both above and below. Thus I have indicated, but by no means completed, the description of the complex mechanical problem involved. To elaborate it further would necessitate my making myself technical and tedious, and would not advance us further in our consideration of the treatment of spinal curvature—the object of this paper.

It is interesting to note that while we have made some degree of progress in our studies of the mechanics of spinal curvature, thus far no theory as to its causation has been advanced which can be made to account for even a large minority of the cases which come under observation. Nor can we, with any degree of certainty, prognosticate what will be the course of a given case of spinal curvature. Professor Lorenz has related his experience with three sisters. The first was sent to him at a time when she presented a mild degree of spinal curvature. Despite all he could do she went on to disfiguring and crippling deformity. By way of precaution, the second sister was brought to him before there was any evidence of distortion! but she, too, in spite of everything, went on to disfiguring and crippling deformity. The case of the third sister he undertook with a feeling akin to despair. The same preventive and corrective measures were tried; but in her case, there never appeared the least suggstion of spinal distortion. Here were three children, born and reared under as nearly as possible identical conditions and subjected to equally cautious medical supervision, but with totally dissimilar and wholly unpredictable results.

In my own experience, the little daughter of one of our most prominent merchants was brought to me with an insignificant spinal deviation of apparently postural causation and calling for "setting up exercises." To my astonishment and consternation her distortion, while remaining flexible, increased steadily and rapidly. I called her father into consultation and explained to him the situation. The mental acumen which had enabled him to accumulate his millions now made it possible for him, in this emergency, to grasp the significance of a situation for which his personal experience had not prepared him. Despite the lamentations of hordes of women folk, and, I am sorry to say, the gloomy prognostications of doctors who somehow became injected into the case, the girl was taken off her feet for eight months and placed upon a curved stretcher of the Whitman type. Here I was enabled, by placing the spine in hyper-extension, first to check the further development of distortion and later to actually reverse the direction of the dorsal and lumbar curves—thereby making the cure permanent.

For habitual or postural scoliosis, before the curvature has become fixed, beside tonics, correction of hygienic errors, sleeping out of doors, and attention to dress, little is needed except "setting up" exercises. It does not matter what system of calisthenics is employed, so long as it is systematically carried out. A vigorous massage, both before and after exercise, is of great value. It is always desirable that the exercises should be performed between two full length mirrors and that the patient's torso should be uncovered so that she can constantly observe and correct any postural errors which may tend to creep into her work.

When a segment of the scoliotic spine has become rigid, and the entire torso has undergone changes of which the distortions of the ribs may be taken as an index, the problem of treatment is more complicated. The spinal column is then a more or less distorted rod with an inflexible middle portion and two flexible ends. It is so placed in the body that it can only be grasped at its extremities, represented by the head and pelvis.

Direct thrusts exerted through the ribs are largely dissipated through the fact that the ribs attach to the spine by joints which allow considerable motion.

Finally the distorted spine is held in distortion by the strains exerted upon it by displacements of the viscera and accommodative shortening or stretching of soft parts throughout the body.

If anyone should ask a mechanic to straighten a rod similarly constructed and equally difficult of approach and subject him to the same handicaps, the man would refuse to make the attempt. But we physicians cannot exercise that prerogative. We *have* to do something. Fortunately for us, the natural tendencies of growth, if we take advantage of them, are on our side.

At this time it is an error to begin with general muscle building exercises. It has been repeatedly observed that the shortened muscles on the concave side of the spinal curve strengthen more rapidly than do their overstretched antagonists of the convexity. Special spine mobilizing exercises have a logical foundation; but even they do not meet the essential needs of the case. First and foremost, the spine has, for some reason, proved inadequate to the demands made upon it. It is stiff and distorted in the extreme of what had been a normal motion. In this respect it may be compared to a spastic flatfoot. And, like the distorted flat foot, it is useless to attempt to treat it while it is being overworked. Such a spine must, for a time at least, be put at rest. This can only be done in recumbency. It has been my custom for some years to put such children to bed upon a gas-pipe and canvas frame which has been so bent as to present curves which are the exact reverse of those of the body when recumbent upon it. That is, when lying upon the frame, the tendency is to hyperextend the dorsal spine and to flex the lumbar segment. In a way, the spine may be said to have become distorted through the application to it, in an oblique direction, of the weight of the head and body. In theory, to reverse the process ought, if persisted in, to straighten the spine. I therefore introduce an upright and crossbar into the upper end of my gaspipe frame. From this is suspended a head sling which is fitted snugly about the patient's chin and occiput. Now, in order to obtain any desired degree of traction upon the patient's spine, it is only necessary to raise the upper end of the stretcher, when the body will tend to slide toward the foot. The higher we raise it the greater will be the pull on the head. It is surprising how great an improvement will take place in spines which are subjected to this treatment.

Results may be further augmented by means of Lange's detorsion apparatus. In this, the patients lie prone upon a table. Strong adjustable uprights offer points of fixation against which the body can be drawn by means of girths which pass around it midway between. These girths draw and then maintain the body in the reverse distortion from that to which it has been accustomed. For example, if a spine is C shaped with its convexity to the left, a girth passes around the body at the apex of the C curve and pulls it over against two properly adjusted uprights located at either end of the C till the left convex spine has been transformed into a right convexity. In this posture it is held for increasing lengths of time up to an hour, twice daily.

When I have obtained all I can by traction, recumbency and posturing, I feel that it is time to begin with forcible correction. To be efficient this method must contemplate holding permanently whatever correction can be obtained at the time of the forcible interference. One must further be in position to exert, and to maintain to any desired degree, thrusts or strains which are directly opposite to those which exist in the scoliotic frame.

We saw that the scoliotic spine presents a rigid segment of variable size, fixed in the extreme of flexion and side bending, between two flexible parts; that this spine can be grasped only by the ends, can be approached only from behind, and that the efforts to influence it through thrusts exerted upon the ribs can have little effect until the normal of motion in the joints of ribs with spine has been exceeded. To meet the problem this condition presents, nothing has thus far proved so efficient as Wullstein's apparatus.

For purposes of illustration, I will assume that we have to do with the more complex form of lateral curvature, the S-shaped right dorsal convex, left lumbar convex type. Here we note first of all, an exaggeration of the normal curves of the spine. The forward curve in the thoracic region is too great, as is the backward curve in the lumbar segment.

Next we observe the lateral deviations of the spinous processes to the right in the dorsal column and to the left in the lumbar region. There is an elevation of one shoulder and asymmetry of the contours of neck and shoulders. As a consequence of the torsion in the lumbar vertebrae, the trunk is displaced on the pelvis backward and to the right. This makes the right hip (actually the right iliac bone) more prominent than the left. Also the frontal planes of thorax and pelvis, instead of being parallel, cross each other and the lateral bodily contours are asymmetrical. Finally the ribs are unduly prominent on the convex side behind, and on the opposite side in front.

The frame of Wullstein's apparatus consists of a great inverted U, twelve feet high. From the middle of the curve of this great U, depends a screw traction appliance to which is attached a head sling, while from the floor, midway between the two arms of the U, rises a steel post upon which is a separate seat for each leg. Each seat is provided with two straps. Horizontal steel, semi-circular bows stretch from one arm of the U to the other, at a variable height from the floor. They afford attachments for apparatus with which tractions or thrusts can be made. The seat may be raised or lowered by means of a screw thread.

When the patient is seated and the head sling and leg straps applied, the forced extension or distraction which we are able to exert through both

upper and lower screw tractions, enables us to correct not only the antero-posterior curves but the greater part of the lateral curves as well. The amount of force exerted is kept always before us by means of a dynamometer.

To correct the displacement to the left of the body on the pelvis, we depress the right half of the seat. As this descends, dragging the hip with it, it recedes, causing a rotation to the right of the lumbar spine. As a consequence, the pelvis comes to lie in a frontal plane, more nearly parallel to that of the thorax and the lateral contours are improved. The asymmetry of neck and shoulders may be corrected by adjustable arm tractions. The prominent ribs, both in front and behind, are pushed in by pressure pads. These pads are incorporated in the jacket.

It is a principle of orthopedic surgery that *overcorrection* is essential to the cure of a deformity. Therefore here we may not be satisfied with a simple correction or re-adjustment to the middle position any more than we would be were we dealing with the correction of a clubfoot. We must aim to overcorrect—to transform a right dorsal into a left dorsal and a left lumbar into a right lumbar convexity; a kyphosis into a lordosis and a lordosis into a kyphosis, if our result is to be permanent.

To give the body the necessary twist, I use the posterior pressure pad, as a fulcrum and the shoulder tractions attached across the chest by a strap as the arms of a lever, by means of which I twist the thorax in the opposite direction to that taken by the dorsal torsion. The untwisting of the lumbar torsion is similarly exaggerated by means of a screw thread which enables the seat to be turned as a whole about its longitudinal axis. To better control lordosis, the seat is provided with a slide controlled by a screw.

With the patient fixed in the machine and the latter adjusted in such a way as to overcorrect, in so far as this is possible, each element of his deformity, I apply my plaster of Paris from his occiput and chin to his groins. When the plaster has hardened and dried I cut out great windows over the places where the ribs had originally been depressed. In this way I utilize the respiratory act in the attempt to force the ribs back to their normal position. With each succeeding jacket I attempt to improve my patient's contours till I believe I have brought him into a position of reversed distortion. How perfectly I can do this necessarily varies with the individual case.

Finally I remove his jacket and put him again upon his frame for a while, so that by massage and resistance exercises, given first in the horizontal and later in the erect posture, his muscles can again be brought to that state of tonicity which is essential to the maintenance of proper postures.

At some other time I may ask your indulgence while I place before you a scheme of what I believe to be the kind of resistance exercises appropriate to certain stages in the treatment of spinal curvature.

HYPOPHYSIS DISEASES AND THEIR DIAGNOSIS.*

C. M. COOPER, M. B., San Francisco.

Vesalius appears to have been the first to describe this organ, and in his "De Corporis Humani Fabrica," 1553, he calls it the *"glans pituitam encipiens,"* under the mistaken idea that this organ secreted the "pituita" or nasal mucous. It is of interest to note here that in the lampreys the pituitary tube which remains during life opens on the dorsal aspect of the head, and, though it does not secrete the nasal mucous, it functions as an external nostril.

Soemmering in 1778 described the gland more fully, and termed it "hypophysis cerebri." Phylogenetically the Tunicata are the first to possess an organ comparable to the human hypophysis in the shape of a gland which opens into the pharynx. In the fishes we find a gland derived from the stomodoeum which comes in contact with a prolongation from the brain. Mammals possess a pituitary body having two distinct parts. In the human the pituitary body or hypophysis is a small reddish gray vascular mass of an oval form measuring about half an inch in its lateral diameter, and one-quarter of an inch in its antero-posterior and supero-inferior diameters, and weighing from five to ten grains. It is confined to a recess in the floor of the skull termed the pituitary fossa, being held laterally by the dura mater which forms the inner walls of the cavernous sinuses. It is very vascular and consists of two lobes. The anterior or inferior lobe much the larger and much the more vascular, is reniform in shape and receives the posterior lobe in its hilus or concavity.

Embryologically the anterior lobe arises as an upward diverticulum of the posterior wall of the primitive pharynx about the fourth week. This pouch of Rathke as it is called becomes nipped off by the developing base of the skull, and as a rare anomaly a remnant of this tube is found transversing the sphenoid bone whilst in men in the pharynx itself a remnant of the pituitary bud develops into a functionating tissue, and according to Haberfeld exists as a pharyngeal hypophysis. The nipped off epithelial cells of Rathke's pouch soon show a differentiation into two parts, one of which gives rise to the anterior lobe, while the other invests the body and neck of the posterior lobe, and to this investing layer of cells the special name of *pars intermedia* has been applied.

Microscopically the anterior lobe has an envelope and a faintly marked internal network of fibrous tissue. In the fibrous tissue meshes columns of cells are present which in young animals line, in older animals fill the alveoli. Sometimes a drop of amorphous material is present in the center of the cell mass, an acinus effect thus being produced, and occasionally the secreted substance is so abundant that the cells are pressed toward the periphery, it imitating as it were a thyroid vesicle.

These cells have been differentiated in accordance with their staining affinities. Thus we have

* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.